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10/646,126	08/22/2003	Jae Wook Yu	2060-3-47	8870

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EXAMINER	
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ART UNIT	PAPER NUMBER
2618	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/646,126	YU, JAE WOOK	
	Examiner	Art Unit	
	Muhammad Akbar	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after t he mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Fig.1 shows in receiving module (item 12) as "TX Filter" similarly in transmission module (item 15) shows "TX Filter" which makes confusion and unclear for understanding of drawing. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Na (U.S. Patent No. 6,226,276 B1) and in view of Soulabail et al (U.S. Pub. No. 2002/0071415 A1).

Re claim 1, Na discloses a mode switching method in a TDD mobile communication system (see title and abstract) comprising: providing a mode switching operation at common node (NC) i.e. start point by the switch (103 of fig.1) between transmission node (NTx) (i.e. uplink signal) and reception node (NRx) (i.e. downlink signal) of a transceiver (see fig.1 and col.4 lines 28-47); setting and resetting the mode switching start point based on specific time interval provided between the reception and transmission signal (i.e. uplink signal and the downlink signal) (see fig.1,3 and col.5 lines 14-27,col.9 lines 8-37); and starting mode switching by the switch (103 of fig.1) at the mode switching common node (NC) start point (see fig.1,3 and col.9 lines 60-67). (setting reception mode first 1 ms and resetting transmission mode next 1 ms, therefore setting and resetting transmission and reception based on specific guard time interval).But Na does not disclose explicitly guard period has variable length. However, Soulabail teaches frame structure for cellular telecommunications system (same field of endeavor) wherein guard period is varied for downlink and uplink transmission (i.e. setting/resetting mode switching start point based on a length of the guard period (guard period 66 and guard period 68 of fig.6 are different length) provided between uplink and downlink signal) (see fig. 6 and para[0034]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of variable length of guard period (66) and guard period (68 of fig.6) provided between uplink and downlink signal (as taught by Soulabail) to transmit/receive error free signal by including variable length of guard period for transmitting uplink and receiving downlink signal by the transceiver in a wireless communication system.

Re claim 2, as discussed above with respect to claim 1, Na discloses determining a mode switching time (MST) (i.e. mode switching time need 1 millisecond for transmission mode and 1 millisecond for reception mode) of the transceiver (see fig.1 and col.4 lines 27-55); and Soulabail further teaches determining a minimum guard period (68 of fig.6) of the transceiver between uplink and downlink slot (see fig.6 and para[0046]); and characterized the MST for guard period (66 of fig.6) is longer than the than the minimum guard period (68 of fig. 6); and start mode switching uplink to downlink (see fig.6 and para [0017],[0020],[0036]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of reset mode of switching time is longer than minimum guard period (68 of fig.6) provided between

uplink and downlink signal (as taught by Soulabail) to adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Re claim 3,4,5, as discussed above with respect to claim 1, Na discloses all the imitations except determining an advancing time offset based on a minimum guard period (GPmin) and shorter than minimum guard period; and setting the mode switching start point before a start point of the minimum guard period of the transceiver based on a mode switching signal; and determining a time deference between the advancing time offset and the start point of GPmin. However, Soulabail further teaches calculation of advance timing based on minimum guard period and advance time shorter than minimum guard period (see fig.6 and para[0034],[0035],[0046],[0047],[0048]); setting mode switching start point of the minimum guard period (68 of fig.6) of the transceiver; and determining a time deference between the advancing time offset and the start point of minimum guard period (68) (see fig.6 and para[0035]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of advance offset time ,reset switching mode based on minimum guard period (68 of fig.6) and calculate between advansce offset time and minimum guard period (as taught by Soulabail) to adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Re claims 6,7,8,9, as discussed above with respect to claim 1,2 Na further discloses performing mode switching based on the mode switching common node (NC) i.e. start point (see fig.1,3) but failed to disclose determining an advancing time offset shorter than the GPmin; and setting the mode switching start point before a start point of a minimum guard period of the system based on a mode switching signal and method of claim 6, wherein the mode switching start point is determined by determining the time difference between the advancing time offset and the start point of GPmin.

However, Soulabail teaches calculation of advance timing based on minimum guard period (see fig.6 and para[0047],[0048]); setting mode switching start point before the minimum guard period (68 of fig.6) of the transceiver ; and determining a time deference between the advancing time offset and the start point of minimum guard period (68) (see fig.6 and para[0035]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of advance offset time ,reset switching mode based on minimum guard period (68 of fig.6) and calculate between advance offset time and minimum guard period (as taught by Soulabail) to adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Re claim 10, Na discloses a mode switching method in a TDD mobile communication system (see title and abstract) comprising: providing a mode switching operation at common node (NC) i.e. start point by the switch (103 of fig.1) between transmission node (NTx) (i.e. uplink signal) and reception node (NRx) (i.e. downlink signal) of a transceiver (see fig.1 and col.4 lines 28-47); and starting mode switching by the switch (103 of fig.1) at the mode switching common node (NC) start point (see fig.1,3 and col.9 lines 60-67); and Na further discloses determining a mode switching time (MST) (i.e. mode switching time need 1 millisecond for transmission mode and 1 millisecond for reception mode) of the transceiver (see fig.1 and col.4 lines 27-55).

But Na does not disclose explicitly for determining an advance time offset based on minimum guard period; setting mode switching start point of the minimum guard period of the transceiver; and MST is greater than the minimum guard period. However, Soulabail teaches frame structure for cellular telecommunications system (same field of endeavor) and Soulabail teaches calculation of advance timing based on minimum guard period (see fig.6 and para[0047],[0048]); setting mode switching start point of the minimum guard period (68 of fig.6) of the transceiver; (see fig.6 and para[0035]); and Soulabail further teaches determining a minimum guard period (68 of fig.6) of the transceiver between uplink and downlink slot (see fig.6 and para[0046]); and characterized the MST for guard period (66 of fig.6) is longer than the than the minimum guard period (68 of fig. 6); and start mode switching uplink to downlink (see fig.6 and para [0017],[0020],[0036]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of reset mode of switching time is longer than minimum guard period (68 of fig.6) provided between uplink and downlink signal (as taught by Soulabail) to adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Re claim 11, Na discloses a mode switching method in a TDD mobile communication system (see title and abstract) comprising: providing a mode switching operation at common node (NC) i.e. start point by the switch (103 of fig.1) between transmission node (NTx) (i.e. uplink signal) and reception node (NRx) (i.e. downlink signal) of a transceiver (see fig.1 and col.4 lines 28-47); setting and resetting the mode switching start point based on specific time interval provided between the reception and transmission signal (i.e. uplink signal and the downlink signal) (see fig.1,3 and col.5 lines 14-27,col.9 lines 8-37); and starting mode switching by the switch (103 of fig.1) at the mode switching common node (NC) start point (see fig.1,3 and col.9 lines 60-67). (setting reception mode first 1 ms and resetting transmission mode next 1 ms, therefore setting and resetting transmission and reception based on specific guard time interval).But Na does not disclose explicitly guard period has variable length. However, Soulabail teaches frame structure for cellular telecommunications system (same field of endeavor) wherein guard period is varied for downlink and uplink transmission (i.e.

setting/resetting mode switching start point based on a length of the guard period (guard period 66 and guard period 68 of fig.6 are different length) provided between uplink and downlink signal) (see fig. 6 and para[0034]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of variable length of guard period (66) and guard period (68 of fig.6) provided between uplink and downlink signal (as taught by Soulabail) to transmit/receive error free signal by including variable length of guard period for transmitting uplink and receiving downlink signal by the transceiver in a wireless communication system.

Re claim 12, as discussed above with respect to claim 11, Na discloses determining a mode switching time (MST) (i.e. mode switching time need 1 millisecond for transmission mode and 1 millisecond for reception mode) of the transceiver (see fig.1 and col.4 lines 27-55); and Soulabail further teaches determining a minimum guard period (68 of fig.6) of the transceiver between uplink and downlink slot (see fig.6 and para[0046]); and characterized the MST for guard period (66 of fig.6) is longer than the than the minimum guard period (68 of fig. 6); and start mode switching uplink to downlink (see fig.6 and para [0017],[0020],[0036]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node

(NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of reset mode of switching time is longer than minimum guard period (68 of fig.6) provided between uplink and downlink signal (as taught by Soulabail) to adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Re claim 13,14,15, as discussed above with respect to claim 11, Na discloses all the imitations except determining an advancing time offset based on a minimum guard period (GPmin); and setting the mode switching start point before a start point of the minimum guard period of the transceiver based on a mode switching signal; and determining a time deference between the advancing time offset and the start point of GPmin. However, Soulabail further teaches calculation of advance timing based on minimum guard period and advance time shorter than minimum guard period (see fig.6 and para[0034],[0035],[0046],[0047],[0048]); setting mode switching start point of the minimum guard period (68 of fig.6) of the transceiver; and determining a time deference between the advancing time offset and the start point of minimum guard period (68) (see fig.6 and para[0035]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of advance offset time ,reset switching mode based on minimum guard period (68 of fig.6) and calculate between advance offset time and minimum guard period (as taught by Soulabail) to

adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Re claim 16,17,18,19, as discussed above with respect to claim 11,12, Na further discloses performing mode switching based on the mode switching common node (NC) i.e. start point (see fig.1,3) but failed to disclose determining an advancing time offset shorter than the GPmin; and setting the mode switching start point before a start point of a minimum guard period of the system based on a mode switching signal and method of claim 6, wherein the mode switching start point is determined by determining the time difference between the advancing time offset and the start point of GPmin. However, Soulabail teaches calculation of advance timing based on minimum guard period (see fig.6 and para[0047],[0048]); setting mode switching start point before the minimum guard period (68 of fig.6) of the transceiver ; and determining a time deference between the advancing time offset and the start point of minimum guard period (68) (see fig.6 and para[0035]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of advance offset time ,reset switching mode based on minimum guard period (68 of fig.6) and calculate between advance offset time and minimum guard period (as taught by Soulabail) to

adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Re claim 20, Na discloses a mode switching method in a TDD mobile communication system (see title and abstract) comprising: providing a mode switching operation at common node (NC) i.e. start point by the switch (103 of fig.1) between transmission node (NTx) (i.e. uplink signal) and reception node (NRx) (i.e. downlink signal) of a transceiver (see fig.1 and col.4 lines 28-47); setting and resetting the mode switching start point based on specific time interval provided between the reception and transmission signal (i.e. uplink signal and the downlink signal) (see fig.1,3 and col.5 lines 14-27,col.9 lines 8-37);and determining a mode switching time (MST) (i.e. mode switching time need 1 millisecond for transmission mode and 1 millisecond for reception mode) of the transceiver (see fig.1 and col.4 lines 27-55).

But Na does not disclose explicitly for determining an advance time offset based on minimum guard period; setting mode switching start point of the minimum guard period of the transceiver; and MST is greater than the minimum guard period. However, Soulabail teaches frame structure for cellular telecommunications system (same field of endeavor), and Soulabail further teaches calculation of advance timing based on minimum guard period (see fig.6 and para[0047],[0048]); setting mode switching start point of the minimum guard period (68 of fig.6) of the transceiver; and Soulabail furthermore teaches characterized the MST for guard period (66 of fig.6) is longer than

the than the minimum guard period (68 of fig. 6); and start mode switching uplink to downlink (see fig.6 and para [0017],[0020],[0036]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mode switching operation at common node (NC) i.e. start point by the switch between transmission node (NTx) and reception node (NRx) of a transceiver (as taught by Na) by incorporating teaching of reset mode of switching time is longer than minimum guard period (68 of fig.6) provided between uplink and downlink signal (as taught by Soulabail) to adjust the time for minimizing delay of transmission/reception signal in a wireless communication system.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure (7.96)

The following patent are cited to further show the state of the art with respect to clips and bookmarks in general:

U.S. Patent No. 6,859,655 to Struhsaker teaches TDD FDD air interface wherein switch provided downlink and uplink transceiver.

U.S. Patent No. 6,388,997 to Scott teaches timing adjustment control for efficient time division duplex communication.

U.S. PG. Pub. 2003/0026215 A1 to Schafer teaches system and method for minimizing guard time in a time duplex communication system.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Muhammad Akbar whose telephone number is (571)-270-1218. The examiner can normally be reached on Monday- Thursday (7:30 A.M.-5:00P.M). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lana Le can be reached on 571-272-7891. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MA

Lana N. Le
8-05-07
LANA LE
PRIMARY EXAMINER